

## ABSTRACT

A method of multiplexing a plurality of data flows into a single output using hierarchical gating operations instead of queues is disclosed. In the preferred embodiment, the  
5 hierarchical multiplexing method comprises sequentially processing a packet at each of a plurality of hierarchical levels by characterizing the flow at each hierarchical level and either passing or discarding the packet. The decision whether to pass or discard a packet is generally made for each packet at one or more hierarchical levels based on traffic parameters and the state of the system such as congestion. In the preferred embodiment,  
10 a Three Color Marker algorithm is used to characterize the flow and mark packets subjecting to the discard decision. The invention may be used by a router or multi-layer switch to process multiple data flows in a hierarchical fashion without hierarchical queues, thereby reducing processing and memory requirements.

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